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## ABSTRACT

The present invention provides compositions and methods for identifying agents that stimulate or inhibit nematode reproduction, especially related to oocyte maturation, sheath cell contraction, and ovulation. It is disclosed that the major 5 sperm protein (MSP) acts in signal transduction of female sexual maturation in nematodes. Provided are compositions and methods for identifying anti-nematode agents with MSP as a target and for controlling nematode populations. MSP is an excellent target for identification of anti-nematode factors because it is highly conserved among members of the phylum Nematoda and is not known to exist in 10 other organisms, especially crops, livestock, pets, and humans. Thus, anti-nematode agents that target MSP are less likely to induce severe side effects when administered to a host and the nematode is unlikely to develop resistance to a highly conserved molecule involved in sexual reproduction.